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(51) INT CL<sup>4</sup>  
**B31D 1/02**

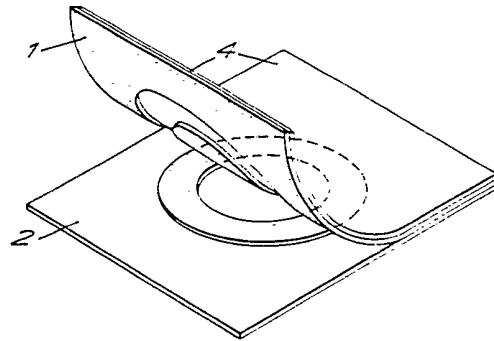
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**None**

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UK CL (Edition J) **B8F FF FBX**  
INT CL<sup>4</sup> **B31D**

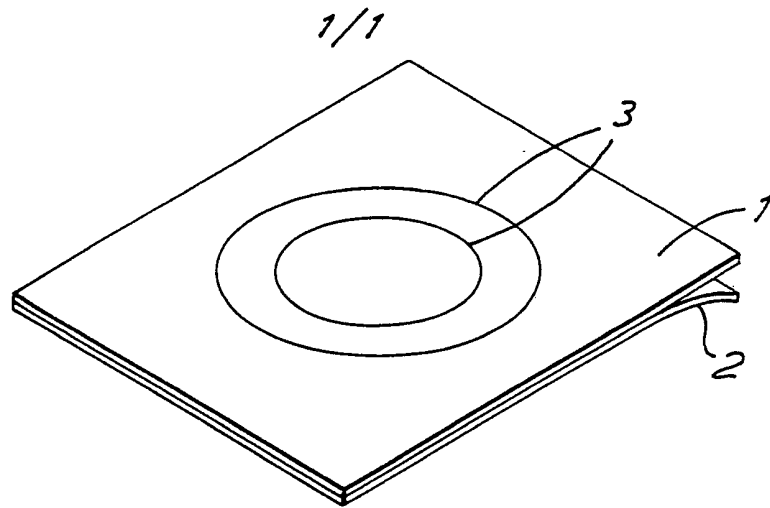
(54) **Peel-off self adhesive stickers and labels**

(57) A method for the manufacture of adhesive labels or stickers mounted on a peel-off backing sheet (2) comprises guiding a cutting tool over the surface of the laminate to form a cut therein delineating the desired label(s) or sticker(s) in the self-adhesive or adhesively coated sheet (1), and dividing said sheet into image and waste areas, said cut being insufficient to penetrate through the backing sheet (2). The waste areas of the cut sheet are stripped from the backing sheet by superimposing thereon, after the cutting operation, a heat and/or pressure sensitive adhesive stripping member (4) having a peel strength, relative to those waste areas, which is greater than that of those waste areas relative to the backing sheet, applying heat and/or pressure to the stripping member thereby to selectively bond the stripping member to the waste areas of the cut sheet, and thereafter removing the stripping member with said waste areas adhering thereto and leaving the image areas still adhering to the backing sheet.

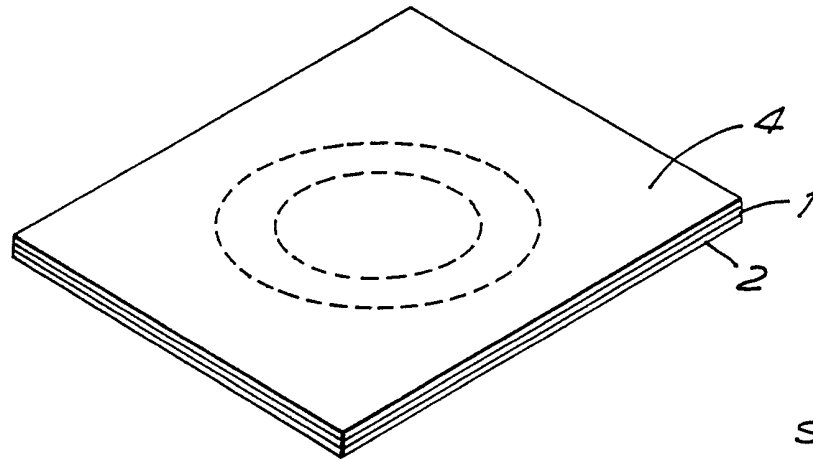


*STEP 3*

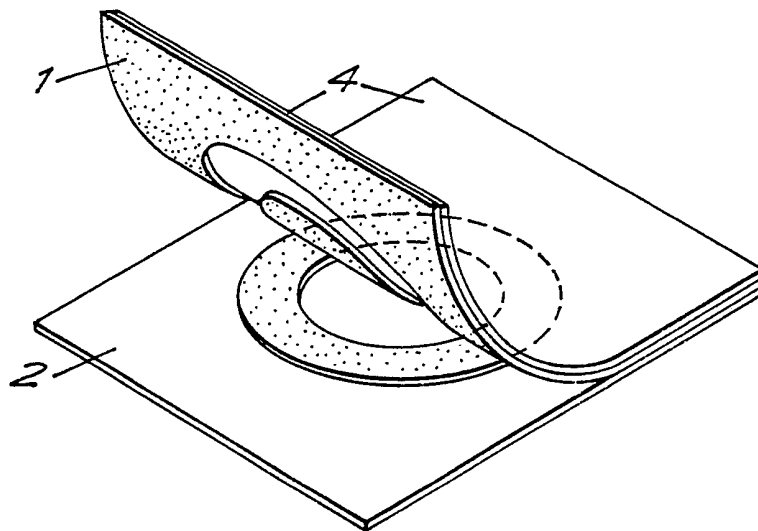
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STEP 1



STEP 2



STEP 3

METHOD FOR THE PRODUCTION OF PEEL-OFF  
SELF ADHESIVE STICKERS AND LABELS

5 This invention relates to a method for the production of peel-off self  
adhesive stickers and labels, that is to say adhesive stickers and labels that  
are manufactured and sold with a peel-off backing sheet, which can be  
peeled-off immediately prior to use, to expose the adhesive surface. For  
the avoidance of doubt, this invention relates to stickers and labels to which  
a layer of pressure sensitive adhesive has been applied and to so-called  
10 "window cling" stickers and labels which have the ability to cling to a  
smooth surface, e.g. a glass, ceramic, or smooth plastic surface, by virtue of  
the inherent properties of the film, rather than by application of a separate  
film of adhesive.

15 The invention relates particularly to the manufacture of rolls or  
sheets of self-adhesive alpha-numerical stickers, i.e. self-adhesive letters  
and numbers, which are used for a wide variety of labelling purposes, but the  
method may also be applied to self-adhesive stickers and labels of other  
designs, where the problem hereinafter to be identified also arises. For sim-  
plicity of description, the invention will be explained with reference to the  
20 manufacture of sheets of self-adhesive alpha-numerical stickers.

In the manufacture of sheets of self-adhesive alpha-numerical and  
other stickers, a preformed, uncut film laminate comprising an uncut sheet  
or film of self-adhesive or adhesively coated sheet material and a peel-off  
backing sheet is placed on the bed of a cutting machine, and a cutting tool,  
25 usually computer guided, is then used to cut the outline of the letters or  
numbers in the sheet of self-adhesive material, the depth of cut being con-  
trolled so that the cutting edge merely penetrates the sheet of self-adhesive  
material, but does not penetrate or sever the underlying peel-off backing  
sheet. Following the cutting operation, the "waste" areas of the adhesive  
30 sheet, e.g. the centres of the letters O and A, for example, and the areas  
between the letters (or numbers as the case may be, or other desired sticker  
shapes) have to be stripped away to leave the array of letters (or numbers or  
other shapes) adhering to the backing sheet. This stripping operation is  
usually carried out by hand, which is both a tedious and time consuming  
35 operation, and which substantially increases the manufacturing costs.

In accordance with the present invention a method and apparatus are

provided for mechanically stripping away the waste areas of the cut self-adhesive film, to leave the letters or numbers or whatever, i.e. the desired image areas, on the backing sheet.

5 According to the invention, this is achieved by laying or passing over the cut laminate, a heat and/or pressure sensitive adhesive stripping member having a greater peel strength than that existing between the sheet of self adhesive material and the peel-off backing sheet, applying heat and/or pressure to the stripping member in those regions superimposed on the waste areas of the cut sheet, thereby to adhere the stripping member to those waste areas, and thereafter stripping those waste areas from the peel-off backing sheet by removal of the stripping member with the waste areas adhering thereto.

15 In the preferred arrangement the stripping member comprises a stripping sheet coated on one face with said pressure and/or heat sensitive adhesive and which is laid onto the cut sheet after the cutting operation. The pressure and/or heat sensitive adhesive is then activated, by heat and/or pressure, in just those regions corresponding to the waste areas of the cut sheet, so that the stripping sheet adheres to those waste areas, but not to the image areas. The stripping sheet is then stripped away removing with it the waste areas of the cut sheet. Instead of using a stripping sheet coated with a layer of heat and/or pressure sensitive adhesive, a plastics film can be used which can itself be made to adhere to the waste areas by the application of heat and/or pressure.

20 When using a computer controlled cutting tool, it is merely necessary to replace the cutting blade by a heated or pressure tool, and then to rerun the program, so that the heated or pressure tool retraces essentially the same path as the cutting tool, or preferably, slightly offset therefrom, whereby heat and pressure is applied to the stripping sheet around the edge of the waste areas of the cut sheet, thereby to cause those waste areas to adhere to the stripping sheet around their respective peripheries. Alternatively, a computer program can be used to control the passage of a pressure head across the superimposed stripping sheet so as to apply pressure to the sheet in those areas overlying the waste areas of the cut sheet, and cause those areas to adhere to the sheet prior to stripping.

35 Alternatively the stripping operation may be effected by a follower system which is mounted on the same mechanism. This system follows the

cutting mechanism activating by heat or pressure a layer of pre-laid waste stripping material. The waste stripping material can either be laid by hand or by an attachment on to the follower system. This follower system basically retraces the cutting tool activating the stripping material on the waste areas, e.g. centres of O, B or other designs.

5 In the alternative, the stripping operation may be effected, for example, by passing a roller over the cut surface of the laminate, or pressing a pressure plate into contact therewith, the roller or pressure plate, as the case may be, having an embossed or raised surface design which is the mirror image of the cut surface of the laminate, i.e. with raised areas corresponding to the waste areas of the cut sheet, those raised surfaces being coated with a pressure and/or heat sensitive adhesive, so as to adhere to those waste areas when brought into contact therewith, and thereby stripped from the underlying backing sheet upon removal of the stripping plate or roller.

10 The principle of the invention is illustrated by the accompanying drawings. For ease of description, this will be made with reference to the manufacture of an adhesive sticker comprising simply the letter "O". It will be understood, however, that the principle of the invention may be applied not only to other letters of the alphabet, numerical stickers, and stickers of numerous other configurations, but also to sheets of stickers, i.e. comprising a multiplicity of adhesive stickers on a single backing sheet.

15 The single sheet drawing represents the three steps of a preferred stripping process in accordance with this invention.

25 Step 1. A preformed laminate sheet consisting of an uncut sheet or film 1 of self adhesive, or adhesively coated material, is shown mounted on a peel-off backing sheet 2 of, for example, siliconised paper. In step 1, the uncut laminate sheet is placed on the bed of the cutting machine (not shown) and a cutting tool (usually computer controlled) passes over the surface of the laminate to make an incision 3 therein outlining the desired sticker or label, in this case the letter O, the incision 3 extending through the adhesive sheet 1, but not the peel-off backing sheet 2.

30 Step 2 In order to peel away the "waste" areas of the cut sheet around and in the centre of the letter O, a second adhesive sheet 4 coated with a layer of pressure and/or heat sensitive adhesive of greater peel strength than the adhesive sheet 1, is superimposed on the cut sheet. That

second adhesive sheet 4, the stripping sheet, is then caused to adhere to the "waste" areas of the cut sheet, before stripping off the stripping sheet, taking those waste areas with it.

5 In a preferred technique, a computer guided heated tool is caused to pass over the superimposed stripping sheet, and to trace thereon the outline of the waste areas to be removed, thus selectively activating the pressure and/or heat sensitive adhesive around the periphery of the waste areas, and causing those waste areas to adhere to the stripping sheet.

10 Alternatively, those regions of the stripping sheet overlying the waste areas may be caused to adhere thereto by pressure selectively applied to those regions by any suitable means, e.g. by means of a computer guided reciprocating hammer, a suitably embossed roller, or a suitably embossed pressure plate.

15 Step 3 In the final step, the stripping sheet 4 is simply peeled away taking with it the waste areas of the underlying cut sheet, and leaving the desired adhesive sticker, i.e. the letter O, still on the peel-off backing sheet.

20 The three steps described thus enable the stripping of the unwanted, waste areas of the cut sheet in and around the stickers, designs or labels to be removed automatically, rather than by hand, and provides a substantial saving in the manufacturing costs of both individual adhesive stickers and sheets of individual stickers mounted on a common peel-off backing sheet.

CLAIMS

1. A method for the manufacture of adhesive labels or stickers mounted on a peel-off backing sheet, which comprises placing on a cutting bed a preformed laminate comprising a self-adhesive or adhesively coated layer of sheet material and a peel-off backing sheet, guiding a cutting tool over the surface of the laminate so as to form a cut therein delineating the desired label(s) or sticker(s) in said self-adhesive or adhesively coated sheet, and dividing said sheet into image and non-image areas, said cut being sufficient to penetrate the adhesive or adhesively coated sheet, but insufficient to penetrate through the backing sheet, and subsequently stripping the non-image or waste areas of the cut sheet from off the backing sheet, thereby to leave the image areas delineating the desired stickers or labels still adhering to the peel-off backing sheet, wherein the non-image or waste areas of the cut sheet are stripped from the backing sheet by superimposing thereon, after the cutting operation, a heat and/or pressure sensitive adhesive stripping member having a peel strength, relative to those waste areas, which is greater than that of those waste areas relative to the backing sheet, applying heat and/or pressure to the stripping member thereby to selectively bond the stripping member to the waste areas of the cut sheet, and thereafter removing the stripping member with said waste areas adhering thereto and leaving the image areas still adhering to the backing sheet.

2. A method according to claim 1, wherein the stripping member comprises a flexible stripping sheet coated with or comprising a heat and/or pressure sensitive adhesive material, which sheet is superimposed on the cut laminate, pressed into contact with the non-image areas of the cut sheet with the simultaneous application of heat and/or pressure, thereby to cause those non-image areas to stick to the stripping sheet, and subsequently stripped from the cut laminate leaving behind on the backing sheet the image areas of the cut sheet, and stripping away the non-image areas.

3. A method according to claim 2, wherein the flexible stripping sheet is bonded to the non-image areas of the cut sheet by guiding a heated tool over the superimposed stripping sheet along substantially the same track as the cutting tool, applying heat and pressure to the tool, thereby to activate the

adhesive sheet along the path followed by the tool, and thereby to form a bond between the stripping sheet and at least the periphery of the non-image areas of the cut sheet.

- 5 4. A method according to claim 2 or 3, wherein heat and/or pressure is selectively applied to the stripping sheet over substantially the whole of those regions which overly the non-image areas of the cut sheet, thereby to form an adhesive bond with the stripping sheet, that bond extending over substantially the whole of the non-image area(s) of the cut sheet.